The Future of Los Alamos National Laboratory in a Changing Political Environment, Addendum

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I. Introduction: A Shift in Nuclear Issues Policies

The upcoming 2008 presidential election will mark a crossroads in American politics. Over the past presidential administration, nuclear security, the international threat of terrorism, and the energy crisis have emerged at the forefront of the United States' debate on national security policy. These issues are critical components of the 2008 presidential election, whose fate in the next presidential administration may mark a significant departure from policies of the past.

National security, or the protection of the nation through economic, military, political, and diplomatic means, has been on the national agenda since the concept of national security was first introduced in the National Security Act of 1947, which established the Department of Defense (DoD), National Security Council (NSC), and Central Intelligence Agency (CIA). However, over the years, the challenges encompassed by national security have grown and evolved. By the time of the writing of the 2002 National Security Strategy, protection against the threat of the use of weapons of mass destruction (WMD) by rogue states and non-state actors had become a priority in the national security agenda.[1] In 2006 the threats to the nation's nuclear security remained much the same: Iran's pursuit of nuclear weapons under the guise of a civilian nuclear energy program, North Korea's defiant nuclear tests, non-state actors' intent of acquiring WMD, and the relative ease with which rogue states and terrorists could acquire fissile material

* The views expressed are the author's own and not those of Los Alamos National Laboratory, the National Nuclear Security Administration or the Department of Energy.
[1] George W. Bush, *The National Security Strategy of the United States of America* (Washington, DC: NSC, 2002), 13-16.

for use in nuclear weapons.[2] While neither the United States nor the Soviet Union used nuclear weapons during the Cold War, the idea that rogue states and non-state actors may actually use them has become a concern. During the Cold War, the theory of mutually assured destruction (MAD) ironically prevented the use of a nuclear weapon. Today, however, there exists the threat that nuclear weapons may become more than instruments of deterrence. The threat of rogue states, such as Iran and North Korea, using nuclear weapons in geopolitical conflicts (e.g. Iranian president Ahmadinejad's aggression towards Israel) and the threat of WMD use by terrorist organizations, although low, remain a real concern. As a result, nuclear non-proliferation has become, and remains, a cornerstone of the United States' security agenda.

In response to the continued threat of nuclear proliferation to national security, Democratic presidential nominee Senator Barack Obama and Republican presidential nominee Senator John McCain have stressed the importance of restoring American leadership abroad as well as ensuring national security at home.[3-4] In stark contrast to the unilaterally-oriented policies of the Bush administration, both candidates advocate multilateral diplomacy and further initiatives to control nuclear proliferation in response to the continuing threat of weapons programs in Iran and North Korea.[5-6] Based on the candidates' statements and voting records, it is likely that, regardless of the candidate elected in November, the U.S. can expect a shift towards a *greater* number of international agreements with existing nuclear weapons states as defined by the Nuclear Non-Proliferation Treaty (NPT), such as Russia and China, to control the

[2] George W. Bush, *The National Security Strategy of the United States of America* (Washington, DC: NSC, 2006), 18-24.
[3] Barack Obama, "Renewing American Leadership," *Foreign Affairs* 86, no. 4 (2007): 2-8.
[4] John McCain, "Remarks By John McCain on Nuclear Security," *John McCain 2008 – John McCain for President*. http://www.johnmccain.com/Informing/News/Speeches/e9c72a28-c05c-4928-ae29-51f54de08df3.htm.
[5] "America at its Best," *The Economist*, June 7th – 13th 2008, 15.
[6] "A Return to Arms Control," *The Washington Post*, June 2, 2008, http://www.washingtonpost.com/wp-dyn/content/article/2008/06/01/AR2008060101881.html.

dangerous spread of nuclear weapons and nuclear technology.[7] Thus, part of this paper will be devoted to presenting evidence for why a reduction in the nation's nuclear stockpile and greater emphasis on nuclear non-proliferation will likely be a part of the new presidential administration's answer to continued nuclear security threats. Such a change will constitute a dramatic shift in the national security agenda. During his tenure, President Bush "proposed to abandon formal arms control treaties while unilaterally reducing the U.S. arsenal, building a missile defense system and beginning the development of new nuclear weapons".[8] Both Obama and McCain have indicated that there will be a reversal of these policies.

Of course, it is impossible to consider policy changes on nuclear deterrence and non-proliferation without also considering the nation's energy policy and the future of nuclear power. Given the rising need for efficient, clean energy, nuclear power is indeed a promising option. Its viability as an alternative energy source, however, is limited by waste storage problems as well as by problems in ensuring the security of the fissile material used in nuclear energy programs. Indeed, the Obama campaign holds that these problems must be addressed before expanding nuclear power.[9] The current lead energy advisor to Barack Obama, Jason Grumet, also recognizes the need to solve the problems associated with nuclear energy.[10] Thus, the future of nuclear technology and its use as an alterative energy source in the next presidential administration will be largely dependent on the success of nuclear non-proliferation efforts and solutions to waste storage. Part of this paper will analyze the presidential candidates' energy policies in light of non-proliferation and waste management efforts to assess the likelihood of a

[7] Ibid.
[8] Ibid.
[9] Barack Obama, "Barack Obama's Plan to Make America a Global Energy Leader," *Obama'08*, Obama for America, http://www.barackobama.com/issues/pdf/EnergyFactSheet.pdf.
[10] Jeff Mason, "All 3 U.S. Presidential Candidates Back Nuclear Power," *International Herald Tribune*, May 7, 2008, http://www.iht.com/articles/2008/05/07/business/nuke.php.

more liberal use of nuclear power in the future administration. It will ultimately be concluded that nuclear energy will play a larger role in the nation's future energy policies, regardless of the election's outcome.

In a recent speech on nuclear security delivered by John McCain, he asserted, "We cannot achieve our non-proliferation goals on our own. We must strengthen existing international treaties and institutions to combat proliferation, and develop new ones when necessary".[11] According to the Obama campaign, Barack Obama has taken similar positions on nuclear security and non-proliferation.[12] Barack Obama's efforts in the Senate, such as introducing the Nuclear Weapons Threat Reduction Act of 2007, show his non-proliferation agenda to generally be in accord with that of John McCain. "As president, I will work with other nations to secure, destroy, and stop the spread of these weapons to dramatically reduce the nuclear dangers for our nation and the world," Obama has promised, "America must lead a global effort to secure all nuclear weapons and material at vulnerable sites within four years—the most effective way to prevent terrorists from acquiring a bomb".[13] Clearly, the role that nuclear weaponry and technology play in U.S. politics is set to change.

The aggressive approaches to halting the spread of nuclear weapons taken by the presidential candidates indicate that the new presidential administration may pursue nuclear security and non-proliferation policies that represent a significant departure from those of the Bush administration and years prior. What does this mean for the future of Los Alamos National Laboratory (LANL)? This paper provides insight to the presidential candidates' national security policies and concludes in a predictive evaluation of the role that LANL will play in national

[11] McCain, "Remarks By John McCain on Nuclear Security".
[12] Glenn Kessler, "McCain Signals Desire to See Reduction in Nuclear Arms," *The Washington Post*, May 28, 2008, http://www.washingtonpost.com/wp-dyn/content/article/2008/05/27/AR2008052701779.html.
[13] Obama, "Renewing American Leadership," 8.

security in the new presidential administration and years afterward. Each candidate's national security policies will be divided into the following three sections:

- Nuclear Weapons & Deterrence
- Nuclear Non-Proliferation
- Nuclear Energy

By understanding the upcoming change in direction of the national security agenda, LANL will be better able to adapt its role to the nation's changing national security goals.

II. Los Alamos National Laboratory: Past and Present

The mission of Los Alamos National Laboratory has changed drastically over the past 65 years. Beginning with the Manhattan Project, Los Alamos became critical to national security. Bringing together some of the biggest names in nuclear physics – J. Robert Oppenheimer, Enrico Fermi, Neils Bohr, Hans Bethe, and Richard Feynman – the Manhattan Project established Los Alamos National Laboratory as a leader in national security. It was Los Alamos' duty to produce the two atomic bombs, Little Boy and Fat Man, that were dropped over Hiroshima and Nagasaki to end World War II.

In the years following, Los Alamos maintained its role in national security – specifically nuclear security – by continuing the development of fission bombs, researching the viability of hydrogen bombs, and strengthening the nation's nuclear stockpile. As nuclear weapons became critical to national security, Los Alamos responded with programs such as Operation Sandstone, which solidified Los Alamos' role in the development of the nation's nuclear stockpile.

During the Cold War, Los Alamos was especially critical to the maintenance and development of the nuclear stockpile as an arms race with the Soviet Union necessitated a strong

nuclear arsenal. However, simultaneous with the need for a reliable nuclear deterrent against the Soviet Union was a growing concern over the safety of nuclear weaponry. In 1963, the Limited Test Ban Treaty (LTBT), a treaty to ban all nuclear weapons testing except for underground testing, was ratified by nations with nuclear capabilities, including the United States and the Soviet Union. Similarly, the NPT signed in 1968 served to limit the spread of nuclear weapons to non-nuclear weapon states (NNWS), promote nuclear disarmament, and prevent the misuse of fissile materials meant for nuclear reactors.

As the Cold War ended and the United States placed a moratorium on all nuclear testing (1992), Los Alamos adapted its mission to stockpile stewardship. Rather than bolstering the nation's nuclear arsenal, Los Alamos used its expertise in nuclear security to maintain the existing stockpile, thereby ensuring a strong, yet safe, nuclear deterrent. Much of this today relies on the improvement of supercomputing, such as the recent development of Roadrunner, whose capabilities include simulating nuclear tests and mapping the human cortex. Other recent developments, such as the Strategic Offensive Reduction Treaty (SORT), or the Treaty of Moscow, have led to further decreases in the nation's nuclear stockpile in favor of conventional defense mechanisms and diplomacy. SORT, for example, mandates the United States and Russia to reduce their strategic nuclear stockpiles to between 1700 – 2200 warheads by the year 2012.

Today, Los Alamos remains a leader in national security, providing a wide range of services in both nuclear and energy security. Los Alamos' extensive history in national security science (not only weapons science, but also super-computing, energy science, and basic R&D) allows it to be well positioned to respond to future national security threats. In fact, in 2007 the National Nuclear Security Administration (NNSA) named Los Alamos National Laboratory as its "preferred alternative site for plutonium research, development, and manufacturing, along

with nuclear weapons design and engineering, and super-computing".[14] While Los Alamos has the continued capability to provide a strong and reliable nuclear deterrent due to its excellence in physics, nuclear materials science, and weapons design/engineering, technologies that Los Alamos has developed as a result of the weapons-driven complex have proven useful in bolstering national security in a broader sense. Supercomputing on systems like Roadrunner, for example, allows for simulations of weather patterns and climate change, the effects of disease and bioterrorism, and even the strength of the nation's infrastructure systems (e.g. the U.S. electricity grid).[15] In addition to stockpile stewardship and waste storage management, Los Alamos has the ability "to support a broad spectrum of mission objectives in…nuclear energy research, nuclear forensics, nuclear safeguards, and counterterrorism".[16] Indeed, Los Alamos also has unique capabilities to help solve the energy crisis facing the nation today. The existing nuclear technology at LANL, especially in waste storage management, is critical to the development of nuclear energy as a viable solution to the nation's growing energy needs.[17]

In the coming presidential election and the changes to national security policy that will likely follow, how will LANL fit into the new national security strategy?

III. Republican Nominee Senator John McCain

In laying out his national security strategy over the course of his presidential campaign, Senator John McCain has demonstrated a commitment to modifying the national security agenda that has come to define the Republican Party for the past eight years, especially in the areas of

[14] Los Alamos National Laboratory, "Preferred Alternative," *Fact Sheets*, http://www.lanl.gov/news/factsheets/docs/complex_trans12-07.pdf.
[15] Ibid.
[16] Ibid.
[17] Los Alamos National Laboratory, "Energy Security Overview," *Fact Sheets*, http://www.lanl.gov/news/pdf/EnergySecurityOverview.pdf.

nuclear and energy security. Under President Bush's Nuclear Posture Review (NPR), new nuclear weapons programs were pursued (although not congressionally approved) and a "preemption doctrine" was recommended. As a result, the NPR reduced reliance on arms control treaties and other diplomatic efforts.[18] No aggressive pursuit of nuclear power has taken place over the past eight years either. Thus, signifying a departure from the policies of the Bush administration, John McCain has stressed the importance of cuts to the nation's nuclear stockpile, multilateralism on nuclear non-proliferation efforts, and greater investment in nuclear energy. Three broad nuclear issues in particular – nuclear weapons and deterrence, nuclear non-proliferation, and nuclear energy – are important when considering the impact the new presidential administration will have on nuclear facilities, such as LANL.

Nuclear Weapons & Deterrence

During his time as a U.S. Senator, John McCain took conservative positions on nuclear arms control. Most notably, John McCain voted against ratifying the Comprehensive Test Ban Treaty (CTBT) in 1999, which would have banned all nuclear testing explosions.[19] McCain believed that simply banning nuclear testing would not necessarily stop rogue states, such as Pakistan, North Korea, and Iran, from *developing* nuclear weapons. Instead, he argued, a strong U.S. nuclear arsenal, which could require underground testing, was essential to deterring states from even developing nuclear weapons in the first place. "Last week's testimony by our nuclear weapons lab directors that the Stockpile Stewardship Program will not be a reliable alternative to nuclear testing for five to ten years is a clear and unequivocal statement that ratification of this

[18] George Bunn and Christopher F. Chyba, eds., *U.S. Nuclear Weapons Policy* (Washington, D.C.: Brookings Institution Press, 2006), 248-286.
[19] John McCain, "Remarks by Senator John McCain (R-AZ) on the CTBT," *Congressional Record – 106th Congress*, 12 October 1999: S12398-99.

treaty is dangerously premature," McCain stated.[20] Testing, he believed, would be critical to ensuring a strong nuclear deterrent. However, during his time in Congress, McCain supported the 1991 Strategic Arms Reduction Treaty (START) with Russia and later voted for cutting the nation's nuclear stockpile to below the levels outlined in START.[21-22]

In his most recent remarks on nuclear security, John McCain has continued to move towards tighter arms control. McCain's recent speech in May 2008 echoed the hopes of former President Ronald Regan that nuclear weapons would someday cease to exist. The elimination of all nuclear weapons has been a position held, most notably, by the Gang of Four (a.k.a. the Four Horsemen) – George P. Shultz and Henry Kissinger, both former secretaries of state; William Perry, former defense secretary; and Sam Nunn, a former senator from Georgia (D). Supposing, however, the near impossibility of this goal in the short-run, McCain outlined a set of pragmatic steps to promote the reduction of the global threat of nuclear weapons yet still maintain a credible nuclear deterrent. He asserted, "We must continue to deploy a safe and reliable nuclear deterrent, robust missile defenses, and superior conventional forces that are capable of defending the United States and our allies".[23]

First, as president, McCain would seek to decrease the number of strategic nuclear weapons that the U.S. currently sustains. McCain stated, "I will seek to reduce the size of our nuclear arsenal to the lowest number possible consistent with our security requirements and global commitments. Today we deploy thousands of warheads. It is my hope to move as rapidly as possible to a significantly smaller force".[24] While McCain did not specify a target range of the

[20] Ibid.
[21] Ibid.
[22] "John McCain on Homeland Security," *On the Issues*, http://www.ontheissues.org/2008/John_McCain_Homeland_Security.htm#Voting_Record.
[23] McCain, "Remarks By John McCain on Nuclear Security".
[24] Ibid.

reduced number of deployed nuclear weapons, McCain suggested the reduction would be conducted in tandem with Russia through new arms control treaties.[25] Currently, the Bush administration is hesitant to reduce the number of strategic nuclear weapons below the range of 1700 – 2200 that was outlined in SORT, but McCain has indicated that he will pursue even further reductions. It is believed that the Bush administration's policies "display a desire to hedge against a worsening of the relationship [with Russia] and a determination to ensure that forces required for deterrence are in place in case they should be needed".[26] Hence, the current administration has not taken action to reduce the number of strategic nuclear weapons below the SORT level. McCain, on the other hand, is more optimistic about diplomatic efforts to reduce the United States' and Russia's stockpiles.

Second, McCain hopes to end the deployment of tactical nuclear weapons to Europe.[27] This is an especially important step since these weapons can by acquired by non-state actors and terrorist organizations.[28] In addition, McCain would like to work with Russia to expand the Intermediate Range Nuclear Forces Treaty (INF) to the rest of the world.[29] Such an initiative would globalize the end of the launching of nuclear and conventional ballistic and cruise missiles with ranges of 300 – 3400 miles.

Third, McCain supports continuing the U.S. moratorium on nuclear testing. Additionally, although he previously opposed the ratification of the CTBT, McCain stated that he would "keep an open mind about future developments".[30] McCain, however, remains committed to ensuring the strength and credibility of the U.S. nuclear deterrent.[31]

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[25] Ibid.
[26] George Bunn and Christopher F. Chyba, eds., *U.S. Nuclear Weapons Policy*, 56.
[27] McCain, "Remarks By John McCain on Nuclear Security".
[28] "A Return to Arms Control".
[29] McCain, "Remarks By John McCain on Nuclear Security".
[30] Ibid.
[31] Ibid.

Finally, as president, McCain will not pursue the development of any new nuclear weapons unless they are critical for the U.S. nuclear deterrent, make it possible to reduce the size of the nuclear stockpile, and support the nation's national security goals.[32] For example, he opposes the Robust Nuclear Earth Penetrator (RNEP) program, saying that it is "a weapon that does not make strategic or political sense".[33] While McCain has not given a hard stance on Reliable Replacement Warheads (RRW), his May 2008 speech on nuclear security seemed to allow for the possibility of future support for the program. According to the NNSA, the RRW program would provide a way to update the nation's nuclear arsenal *and* decrease its size.[34] Thus, RRW work may be a possibility if McCain wins the election.

Nuclear Non-Proliferation

In outlining his goals for nuclear non-proliferation, John McCain envisions multilateral cooperation. "It is a vision not of the United States acting alone, but building and participating in a community of nations all drawn together in this vital common purpose", McCain stated in a speech on nuclear security.[35] In addition to working with Russia on reducing stockpiles below SORT levels and globalizing the INF, McCain plans to work with other nuclear weapons states (as defined by the NPT).

As outlined in his speech, McCain first aims to cooperate with China to ensure their compliance with the practices of the United States, Russia, the United Kingdom, and France (the other four nuclear weapons states recognized by the NPT). McCain hopes that this will eventually lead China to reduce its nuclear stockpile and halt the production of nuclear weapons-grade material. In addition, McCain supports the U.S.-India Civil Nuclear Accord, believing it

[32] Ibid.
[33] Ibid.
[34] Todd Jacobson, "McCain supports Cuts to Nuclear Weapons Stockpile," *Nuclear Weapons & Materials Monitor*, June 2, 2008: 2.
[35] McCain, "Remarks By John McCain on Nuclear Security".

will help engage states with confirmed nuclear capabilities, such as India and Pakistan, in the fight against nuclear proliferation.[36] This is an important step to help guard against the sharing of nuclear technology with non-nuclear states, especially after the A.Q. Khan incident.

Second, McCain supports strengthening existing international agreements that combat nuclear proliferation. On the international front, this includes initiating a Fissile Material Cut-off Treaty with other countries and improving the Proliferation Security Initiative (PSI) in order to restrict the spread of nuclear weapons and their materials. On the domestic front, McCain advocates taking a greater lead in non-proliferation efforts by establishing an increase in funding for U.S. non-proliferation initiatives, such as the Cooperative Threat Reduction (CTR) programs.[37]

Third, McCain suggests revising some of the policies that govern two of the most important international nuclear security institutions: the NPT and the International Atomic Energy Agency (IAEA). As president, McCain would seek to strengthen the NPT at an international review conference in 2010. This might include measures to enforce penalties for states that violate the "Atoms for Peace" agreement (an agreement that provides nuclear resources to states who demonstrate good behavior in nuclear matters). This would provide a greater disincentive for states to breach or withdraw from the NPT. McCain also supports an overall strengthening of the IAEA by providing it more funding. Doing so would allow for greater oversight of nuclear weapons programs and nuclear technology transfer as well as better enforcement of the NPT.[38]

Finally, McCain intends to address the problem of illicit nuclear weapons programs. Using nuclear energy as a disguise for nuclear weapons manufacturing poses a threat to global

[36] Ibid.
[37] Ibid.
[38] Ibid.

non-proliferation. McCain proposes the establishment of international facilities that distribute nuclear fuel to countries that agree to abandon their own enrichment and reprocessing programs. There is also the possibility of creating an international waste repository site so as to reduce the risk of spent fuel being re-used in weapons.[39]

Nuclear Energy

Energy security is inextricably linked with nuclear security. Currently, nuclear energy is the only green energy option that could, by itself, sustain U.S. energy needs. Given the recent exponential rise in the cost of crude oil, energy has become one of the most important issues in the 2008 presidential campaign season, especially nuclear energy. Two problems in particular, however, limit the spread of nuclear energy as an alternative to coal in the United States and have emerged at the forefront of the debate: the safety of waste management and the security of nuclear fuel. However, as outlined in his recent Lexington Project Initiative, a proposal to eliminate foreign oil dependency, McCain is a strong supporter of nuclear energy and, if elected, plans to construct 45 new nuclear reactors by the year 2030.[40] In the long run, McCain hopes to build as many as 100 new nuclear power plants. In his speech on June 25, 2008, McCain stated, "The need for more production extends as well to another long-neglected source of energy, and that is nuclear power. Here, too, opposition to this clean and proven technology has more to do [with] politics than with the merits. The experience of nations across Europe and Asia has shown that nuclear energy is efficient. It is safe, it is proven, and it is essential to America's energy future".[41] Nuclear energy is only one part of the "kitchen-sink" approach that McCain has proposed to solve the country's energy crisis. Combined with the many other measures stated in

[39] Ibid.
[40] John McCain, "Remarks by John McCain on his Comprehensive Plan for Energy Security," *John McCain 2008 – John McCain for President*. http://www.johnmccain.com/Informing/News/Speeches/1b708e23-5496-42a3-8771-aec271bf823e.htm.
[41] Ibid.

the Lexington Project Initiative, McCain believes that the United States can "achieve strategic independence by 2025".[42] Some of McCain's other proposals include investigating clean coal technology; pursuing wind, hydro, and solar power; establishing a Clean Car Challenge (a $5,000 tax credit to each buyer of a zero carbon emission vehicle); improving automobile battery technology (a $300 million prize for building a better automobile battery); drilling for oil off American shores; and creating monetary incentives for greater basic R&D.[43] In the long term, however, McCain still sees nuclear energy as a critical component of the solution to the nation's energy problems. McCain has stated that it is a "safe, efficient, inexpensive and obviously vital ingredient in the future of the economy of our nation and in our mission to eliminate over time our dependence on foreign oil".[44] According to McCain, nuclear energy today is necessary if we are to pursue other green energy technologies tomorrow, such as electric cars.[45] Thus, in the long run, McCain foresees a national energy strategy that utilizes science and technology—particularly nuclear technology.[46]

However, in order to enhance the feasibility of nuclear energy, McCain offers a couple solutions to opponents' two major objections. First, McCain supports the storage of nuclear waste at Nevada's Yucca Mountain.[47] He has also indicated interest in creating an international waste repository site, which, he contends, "could make it unnecessary to open the proposed spent nuclear fuel storage facility at Yucca Mountain in Nevada".[48] An international waste repository site would also ensure that spent fuel would not find its way into the hands of rogue states and

[42] Ibid.
[43] Ibid.
[44] Mary Ann Giordano and Larry Rohter, "McCain at Nuclear Plant Highlights Energy Issue," *The New York Times*, http://www.nytimes.com/2008/08/06/us/politics/06nuke.html.
[45] Ibid.
[46] Ed Hornick, Kerith McFadden and Alan Silverleib, "Obama, McCain Energy Plans," *CNN*, http://www.cnn.com/2008/POLITICS/08/05/energy.plans.
[47] Jon Ralston, "John McCain on Yucca Mountain," *Las Vegas Sun*, http://www.lasvegassun.com/politics/voterguide/2008/john-mccain/issues/yucca.
[48] McCain, "Remarks By John McCain on Nuclear Security".

non-state actors who wish to re-use it in a nuclear weapon. Second, in response to the problem of nuclear energy used as a cover for illicit nuclear weapons programs, McCain suggests that nations stop independent enrichment and reprocessing in favor of an international nuclear fuel supply that can be better monitored.[49] This would ensure that nuclear fuel is used for legitimate civilian nuclear energy programs instead of for nuclear weapons.

IV. Democratic Nominee Senator Barack Obama

Despite being a relative newcomer to the political arena, Senator Barack Obama has already established a position on nuclear and energy security. It is critical to note that Obama's national security policies closely resemble those of McCain. After the May 2008 speech on nuclear security given by McCain, the Obama campaign responded, "By embracing many aspects of Barack Obama's non-proliferation agenda today, John McCain highlighted Obama's leadership on nuclear weapons throughout this campaign, and his bipartisan work with Richard Lugar in the Senate".[50] While Obama and McCain agree on many aspects of nuclear and energy security, Obama has taken a somewhat harder stance on nuclear disarmament and diplomatic efforts to prevent nuclear proliferation and a more cautious stance on investment in nuclear energy. Thus, three broad nuclear issues – nuclear weapons and deterrence, nuclear non-proliferation, and nuclear energy – are important when considering the impact an Obama administration would have on nuclear facilities, such as LANL.

Nuclear Weapons & Deterrence

Although Obama, unlike McCain, was not a Senator at the time of the congressional vote on the ratification of the CTBT (Obama became the junior Senator from Illinois in 2004), Obama

[49] Ibid.
[50] The Associated Press, "McCain Offers Plan to Reduce Nuclear Weapons," *MSNBC*, May 27, 2008, http://www.msnbc.msn.com/id/24841912.

has stressed his support of the CTBT. Obama has stated, "We should take advantage of recent technological advances to build bipartisan consensus behind ratification of the Comprehensive Test Ban Treaty. All of this can be done while maintaining a strong nuclear deterrent. These steps will ultimately strengthen, not weaken, our security".[51] Furthermore, Obama has also emphasized his agreement with the Gang of Four's proposal to eliminate all nuclear weapons. Obama, in contrast to McCain, believes this goal can be made a reality and intends to adhere to the NPT, following the steps necessary to eliminate nuclear weapons.[52]

Obama's recent action in the Senate is another good indicator of his overall position on nuclear weaponry. Obama has worked with Senator Dick Lugar (R-IN) to pass the Lugar-Obama Act, which was signed by President Bush on January 11, 2007. The legislation created an initiative to reduce stockpiles of conventional weapons and to make it easier for the Department of State to find and stop the transfer of WMD between countries.[53-54] In 2007, Obama also proposed another piece of legislation entitled the Nuclear Weapons Threat Reduction Act of 2007 (co-sponsors are Senator Richard Durbin, D-IL and Senator Chuck Hagel, R-NE). Although it has not yet proceeded to the House of Representatives or the Senate for debate (it is still being considered in the Senate Foreign Relations Committee), it outlines some of the proposals we may be able to expect from Obama should he win the presidency. This legislation included establishing an international nuclear fuel bank, funding for a national nuclear forensics program, and taking stronger leadership on securing nuclear material and supporting peaceful

[51] Obama, "Renewing American Leadership," 8-9.
[52] Barack Obama, "Remarks of Senator Barack Obama: A New Beginning," *Obama'08*, Obama for America, http://www.barackobama.com/2007/10/02/remarks_of_senator_barack_obam_27.php.
[53] "Lugar-Obama Bill to Keep Weapons Out of Terrorists' Hands Heads to Senate Floor," *Barack Obama: U.S. Senator for Illinois*, May 23, 2006, http://obama.senate.gov/press/060523-lugar-obama_bil.
[54] "Lugar-Obama Nonproliferation Legislation Signed into Law by the President," *Barack Obama: U.S. Senator for Illinois*, January 11, 2007, http://obama.senate.gov/press/070111-lugar-obama_non.

nuclear technology.[55] Given Obama's track record, there are two major directives on nuclear weapons and deterrence that we can expect should he win the presidency.

First, Obama will seek a world with no nuclear weapons. The first step in this process will be to stop production of new nuclear weapons. In an article in *Foreign Affairs*, Obama writes, "American must not rush to produce a new generation of nuclear warheads".[56] This likely means he will be cautious in pursuing RRW. Reviving the RNEP program is unlikely. In addition, Obama sees a "dramatic reduction" in the American and Russian nuclear arsenals. While Obama believes in a world free of nuclear weapons, Obama intends to keep a strong, reliable, and credible nuclear deterrent as long as they are in existence.[57] This means pursuing multilateral disarmament, especially with Russia, who holds many of the world's nuclear weapons. Obama advocates encouraging Russia to remove missiles from "hair-trigger alert". For Obama, this is a remnant of Cold War politics and must be addressed if we are to move towards a nuclear weapons free world.[58] Finally, like McCain, Obama would like to cooperate with Russia to globalize the INF.[59]

Second, Obama will continue the current moratorium on U.S. nuclear testing. As suggested in his Nuclear Weapons Threat Reduction Act of 2007, Obama believes in the ban on nuclear testing.[60] This directive is especially clear in light of Obama's support of the ratification of the CTBT.

Nuclear Non-Proliferation

[55] U.S. Congress. Senate. *Nuclear Weapons Threat Reduction Act of 2007*. S.1977. 110th Cong., 1st sess. (August 2, 2007). http://www.govtrack.us/congress/billtext.xpd?bill=s110-1977.
[56] Barack Obama, "Renewing American Leadership," 8.
[57] Barack Obama, "Remarks of Senator Barack Obama: A New Beginning".
[58] Barack Obama, "The American Moment: Remarks to the Chicago Council on Global Affairs," *Obama'08*, Obama for America, http://www.barackobama.com/2007/04/23/the_american_moment_remarks_to.php.
[59] Barack Obama, "Remarks of Senator Barack Obama: A New Beginning".
[60] U.S. Congress. Senate. *Nuclear Weapons Threat Reduction Act of 2007*.

Barack Obama has extensive plans for nuclear non-proliferation efforts should he win the presidential nomination in November. Similar to McCain, Obama endorses multilateral efforts to reduce the risk of nuclear proliferation. Obama, however, places greater emphasis on diplomacy, which marks a drastic departure from the practices of the Bush administration. In an Obama administration, several major directives can be expected.

First, Obama is committed to ensuring that nuclear weapons and materials are secured from terrorists. It is Obama's intent to secure all existing nuclear weapons and materials at "vulnerable" sites by the end of his first term in office (i.e. within four years).[61] It is in this way, Obama contends, that the threat of the use of nuclear weapons by non-state actors, such as Al Qaeda, can be reduced. Obama states, "There is still about 50 tons of highly enriched uranium, some of it poorly secured, at civilian nuclear facilities in over forty countries. There are still about 15,000 to 16,000 nuclear weapons and stockpiles of uranium and plutonium scattered across 11 time zones in the former Soviet Union".[62] Thus, in addition to his plan to secure loose nuclear material, Obama also supports a world-wide ban on the production of fissile material for weapons.[63] This is similar to McCain's support of a Fissile Material Cut-off Treaty. Such an effort will help to guard against the acquisition of weapons by terrorist organizations. Finally, as indicated by his previous legislation, Obama also supports strengthening the PSI.[64] According to Obama, the best way to ensure the security of the United States is *not* to threaten terrorist organizations with U.S. use of a nuclear weapon but rather to prevent terrorist organizations from ever acquiring weapons in the first place.[65]

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[61] Barack Obama, "Renewing American Leadership," 8.
[62] Barack Obama, "Remarks of Senator Obama: The War We Need to Win," *Obama'08*, Obama for America, http://www.barackobama.com/2007/08/01/remarks_of_senator_obama_the_w_1.php.
[63] Ibid.
[64] U.S. Congress. Senate. *Nuclear Weapons Threat Reduction Act of 2007*.
[65] Barack Obama, "Foreign Policy," *Obama'08*, Obama for America, http://www.barackobama.com/issues/foreignpolicy.

Second, Obama intends to support and strengthen the NPT as well as the IAEA. He advocates harsher penalties for countries that break the obligations outlined in the NPT.[66] The intent is to give states a larger disincentive to breach compliance with the NPT. Obama has also pledged to give $50 million to help start an IAEA-sanctioned international nuclear fuel bank.[67] This is Obama's solution to states that use civilian nuclear energy programs as a cover for illicit nuclear weapons programs. While Obama expects the fuel bank to be initiated by the U.S., Obama would also like to engage other nations, beginning with Russia, and private initiatives. The Nuclear Threat Initiative, for example, has already decided to help fund the fuel bank if the U.S. government agrees to a matching program where private donations are matched two to one.[68]

Finally, Obama supports a dramatic increase in American diplomatic efforts. Obama states, "I won't hesitate to use the power of American diplomacy to stop countries from obtaining these weapons or sponsoring terror. The lesson of the Bush years is that not talking does not work. …We haven't talked to Iran, and they continue to build their nuclear program. We haven't talked to Syria, and they continue support for terror. We tried not talking to North Korea, and they now have enough material for 6 to 8 more nuclear weapons".[69] Diplomacy in an Obama administration would mean negotiating with rogue states, such as Iran and North Korea; discouraging countries, such as Syria and Saudi Arabia, from pursuing nuclear programs; and working with our allies to ensure nuclear security and strong non-proliferation efforts.

Nuclear Energy

[66] Ibid.
[67] Barack Obama, "Renewing American Leadership," 9.
[68] Barack Obama, "The American Moment: Remarks to the Chicago Council on Global Affairs".
[69] Barack Obama, "Remarks of Senator Obama: The War We Need to Win".

In the debate on energy security, Barack Obama has expressed a cautious approach to the expanded role of nuclear energy in the nation's energy strategy due to several problems that he sees associated with it. Although nuclear energy makes up over 70 percent of the nation's non-carbon powered electricity as well as 20 percent of the nation's overall electricity production, Obama states that the future of nuclear power will be limited if there are no solutions to several of its problems.[70-71] These obstacles, according to Obama, are as follows: "public right-to-know, security of nuclear fuel and waste, waste storage, and proliferation".[72] Indeed, it is these objections to nuclear energy that have slowed its expansion in the United States in recent years. Obama recognizes the criticality of nuclear power to the nation's energy security and independence, especially if he is to accomplish his goal of getting rid of the need for Middle Eastern and Venezuelan oil within ten years. Therefore, he has established some initiatives to help solve the problems that prevent nuclear energy from being expanded. On the issues of non-proliferation and the security of nuclear materials, Obama intends to continue the efforts he initiated with Senator Dick Lugar in the Lugar-Obama Act, which aimed to stop the international transfer of WMD.[73] Obama's plans for an IAEA-sanctioned international nuclear fuel bank would also help prevent nuclear fuel from being used in nuclear weapons by non-state actors and terrorist organizations. On the issue of waste storage, Obama is adamant that waste from nuclear reactors be stored safely; however, Obama is against a waste repository site at Yucca Mountain in Nevada.[74] Obama intends to support efforts to look for safe repository sites as well as to establish standards for the waste that is currently stored to ensure safety and security.[75] Despite

[70] Barack Obama, "Barack Obama's Plan to Make America a Global Energy Leader".
[71] Stephen Power, "In Energy Policy, McCain, Obama Differ on Role of Government," *The Wall Street Journal*, June 9, 2008, http://online.wsj.com/article/SB121296676181055711.html.
[72] Barack Obama, "Barack Obama's Plan to Make America a Global Energy Leader".
[73] Ibid.
[74] Stephen Power, "In Energy Policy, McCain, Obama Differ on Role of Government".
[75] Barack Obama, "Barack Obama's Plan to Make America a Global Energy Leader".

the problems that Obama foresees with nuclear power, he still sees "a stepped-up role" for it.[76] Nuclear power is an imperative part of the nation's energy strategy if the U.S. is to reduce carbon emissions 80 percent below 1990 levels by 2050, as Obama hopes. It is important to note that while McCain also supports expanded nuclear power, McCain only plans to reduce U.S. carbon emissions 60 percent below 1990 levels in the same time frame.[77] In addition to his goals for nuclear energy, Obama also intends to establish a cap-and-trade program, invest in biofuels, build clean coal technology, transition to a digital electricity grid, and promote flexible fuel vehicles (FFVs), among many other initiatives.[78] In his overall national energy strategy, Obama leaves room for nuclear energy but only if it is safe and secure. Thus, while nuclear energy is likely to play a greater role in the nation's energy future, it may have a stronger presence in a McCain administration than in an Obama administration.

V. Conclusions: A Future for Los Alamos National Laboratory

The Future of Nuclear and Energy Security

Given the analysis of the presidential candidates' nuclear security policies, it is clear that LANL can expect two changes in the next presidential administration: a renewed effort to reduce the nuclear stockpile and greater emphasis on nuclear non-proliferation through diplomacy and international arms control treaties. The similarity between McCain's and Obama's stances on nuclear security means that LANL can expect these changes regardless of the outcome of the election in November. In fact, Stephen Biegun, an advisor to McCain, has stated that there is about "90 percent" agreement between the two candidates on nuclear weapons and non-

[76] Stephen Power, "In Energy Policy, McCain, Obama Differ on Role of Government".
[77] Ibid.
[78] Barack Obama, "Barack Obama's Plan to Make America a Global Energy Leader".

proliferation issues.[79] Similarly, Victor Reis, a top policy advisor to the Secretary of Energy Samuel Bodman, stated, "When we look to the next administration, there are going to be fewer nuclear weapons: We don't think that's going to change".[80]

The future of energy security in the next presidential administration is also predictable, given both candidates' belief in the expanded role of nuclear energy. McCain strongly backs nuclear energy as well as waste repository at Yucca Mountain. In addition, McCain is committed to finding solutions to the two problems that critics of nuclear energy often expound: waste storage management and nuclear energy used as a cover for nuclear weapons programs. Obama, on the other hand, supports nuclear energy but remains more cautious in its expansion due to the aforementioned problems. Obama, for example, does not support waste storage at Yucca Mountain. It is clear, however, that neither of the candidates' goals for reducing carbon emissions can be reached without a drastic overhaul of the nation's energy policy, especially in the use of nuclear energy. Therefore, it is likely that LANL will see nuclear energy play a larger role in the nation's energy strategy.

The Future of Los Alamos National Laboratory

Los Alamos National Laboratory has already begun to take the proper steps to prepare for the new presidential administration's nuclear and energy security policies. Over the past few years, LANL has already seen and felt the effects of a shift from a weapons-based complex focused on stockpile stewardship to a complex based on supporting a broader national security mission. As U.S. support for nuclear weapons decreases and the world calls for greater non-proliferation efforts, LANL must, in turn, adapt its mission to fit the nation's national security

[79] Todd Jacobson, "Obama, McCain Find Middle Ground on Nuke Weapons Policy," *Nuclear Weapons & Materials Monitor*, June 23, 2008: 7.
[80] Rebecca Cooper, "DOE Hoping to Link Weapons, Nuclear Power, and Climate," *Nuclear Weapons & Materials Monitor*, June 2, 2008: 3.

goals and needs. Indeed, LANL is now more important than ever to the effort to solve current national security problems. In the future presidential administration and years afterward, LANL needs to shift the skills it has gained as a result of its work in nuclear science towards research on nuclear energy and other alternative, "green" energies; nuclear waste storage management; climate-change and global warming; the effects of disease and biological and chemical terrorism; materials science; supercomputing; and basic R&D. In addition, LANL will still remain a key institution in nuclear deterrence. Although we can expect a reduced nuclear arsenal, LANL will remain important to ensuring that a smaller nuclear stockpile does not result in a less safe or less credible nuclear deterrent. Furthermore, new nuclear issues such as nuclear forensics and counter-terrorism will continue to require LANL's expertise in nuclear science.

The Department of Energy (DOE), NNSA, and LANL Director Michael Anastasio have already indicated that LANL, and national laboratories in general, will be shifting towards a broader mission of national security science. DOE has expressed that they are "looking to integrate the nation's nuclear weapons policy, climate change policy and nuclear power network as the programs continue into the next administration".[81] Victor Reis has also stated, "You've got to start with a mission that is weapons, climate, and energy. We shouldn't think of them as separate stovepipe missions, because the world has changed a lot recently, and we need to think of them as the same thing".[82] Similarly, NNSA has also indicated that the national laboratories, including LANL, will play a large role in helping to answer broad national security questions.[83] The Director of LANL, Michael Anastasio, has also begun to lead Los Alamos in its new mission: to "ensure the safety, security, and reliability of the U.S. nuclear deterrent; reduce

[81] Ibid.
[82] Ibid., 4.
[83] National Nuclear Security Administration, "NNSA Labs Will Play Prominent Role in U.S. National Security," *NNSA News*, June 26, 2008, http://www.lanl.gov/news/newsbulletin/pdf/NNSA_News_062608.pdf.

global threats; and solve emerging national security challenges".[84] Finally, LANL itself is moving in the direction of a broader national security science mission through such projects as:

- Roadrunner
- MaRIE
- PowerFactoRE
- AngelFire
- Parallel Ocean Program (POP) / Sea Ice (CICE)
- DARHT

As LANL moves into the next presidential administration and years beyond, it must continue to re-evaluate its mission and role in the national security strategy. For now, LANL must become a truly *integrated* complex that focuses not only on nuclear science but also on a variety of other sciences that contribute to all aspects of national security.

[84] Los Alamos National Laboratory, "Building the Future of Los Alamos: The Premier National Security Science Laboratory," *Los Alamos National Laboratory*.

Appendix

Figure 1: Comparison of Nuclear Weapons and Deterrence Policies

Nuclear Weapons and Deterrence		
	Barack Obama	**John McCain**
Overall Goal:	*Dramatically reduce the size of the U.S. nuclear arsenal with the long term goal of eliminating all nuclear weapons. Will work to ensure a credible nuclear deterrent while nuclear weapons still exist.*	*Reduce the size of the U.S. nuclear arsenal and avoid the development of new nuclear weapons, yet still maintain a credible nuclear deterrent.*
Policies:	• Believes in the elimination of all nuclear weapons. • Pursue dramatic reduction in the size of the American and Russian nuclear arsenals (no specific numbers given). • Work with Russia to globalize the Intermediate Range Nuclear Forces Treaty. • Continue the U.S. moratorium on nuclear testing. • Supports the CTBT and will work to ratify it. • Will not pursue the development of new nuclear weapons (RNEP and RRW are unlikely).	• Work with Russia to decrease the number of strategic nuclear weapons below SORT levels (1700 – 2200). • End the deployment of tactical nuclear weapons to Europe. • Work with Russia to globalize the Intermediate Range Nuclear Forces Treaty. • Continue the U.S. moratorium on nuclear testing. • Will keep an open mind about ratification of the CTBT. • Will not pursue the development of new nuclear weapons, including RNEP. RRW work a possibility.

Figure 2: Comparison of Nuclear Non-Proliferation Policies

Nuclear Non-Proliferation		
	Barack Obama	**John McCain**
Overall Goal:	*Engage in a multilateral effort to reduce the risk of nuclear proliferation. Emphasis on diplomacy.*	*Engage in a multilateral effort to reduce the risk of nuclear proliferation.*
Policies:	• Secure all existing nuclear weapons and materials at vulnerable sites within four years to guard against use by non-state actors. • Supports world-wide ban on the production of fissile material for weapons (similar to McCain's Fissile Material Cut-off Treaty). • Strengthen the Proliferation Security Initiative. • Support and strengthen the NPT by instituting harsher penalties for countries that break the obligations of the NPT. • Give $50 million to help start an IAEA-sanctioned international nuclear fuel bank to prevent countries from using civilian nuclear energy programs as a cover for illicit nuclear weapons programs. • Supports a dramatic increase in American diplomatic efforts to stop nuclear proliferation.	• Cooperate with China to ensure its compliance with the practices of the other four nuclear weapons states as defined by the NPT. • Supports the U.S.-India Civil Nuclear Accord. • Strengthen existing agreements that combat nuclear proliferation and create new ones (initiate a Fissile Material Cut-off Treaty, improve the Proliferation Security Initiative, and increase funding for U.S. non-proliferation programs). • Strengthen the NPT at its review conference in 2010. • Provide more funding to the IAEA for greater oversight of nuclear weapons programs and nuclear technology transfer. • Establish international facilities that distribute nuclear fuel to countries that agree to abandon their own enrichment and reprocessing programs. • Create international waste repository site to reduce the risk of spent fuel being re-used in weapons.

Figure 3: Comparison of Nuclear Energy Policies

Nuclear Energy		
	Barack Obama	**John McCain**
Overall Goal:	*Sees a "stepped-up role" for nuclear energy in the national energy strategy but is cautious about its expansion before several of its problems are overcome. Eliminate need for Middle Eastern and Venezuelan oil in 10 years.*	*Strongly supports nuclear energy and would expand its role in the national energy strategy. Achieve strategic energy independence by 2025.*
Policies:	• Expand nuclear energy only when it is safe and secure to do so (nuclear materials are secure from rogue states/non-state actors and waste can be stored safely). • Opposes the storage of nuclear waste at Yucca Mountain in Nevada. • Supports establishing an IAEA-sanctioned international nuclear fuel bank. • Reduce carbon emissions 80 percent below 1990 levels by 2050.	• Will focus on scientific and technological energy solutions, especially nuclear energy. • Construct 45 new nuclear reactors by the year 2030. Hopes to build as many as 100 new nuclear plants in the long run. • Supports the storage of nuclear waste at Yucca Mountain in Nevada. • Supports establishing an international waste repository site (an alternative to Yucca Mountain). • Supports establishing an international nuclear fuel supply and abandoning independent enrichment and reprocessing. • Reduce carbon emissions 60 percent below 1990 levels by 2050.

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